No.	Operator.	Bones removed.	Result.	Authority.	Remarks.
28	Liston (1832)	Scaphoid, two cuneiforms, and upper surface of astragalus	"Did not succeed"	Blackman's Mott's Velpeau, II. 483	
29	Skey	Necrosed portions of tarsus and parts of scaphoid and cuneiform	Recovery	London Lancet, Dec. 4, 1858	
30	Bradford	Small part of astragalus, os calcis, and cuboid	Excellent recovery	Gross' Syst Surg., II. 1094	
31	Humphrey	Ankle-joint, astragalus, and scaphoid	Failure	London Lancet, Aug. 6, 1864	Subsequent amputation.
32	Holmes	Astragalus and scaphoid	Recovery	London Lancet, May 27, 1865	
33	Langenbeck	Ankle-joint, astragalus, cuboid, part of os calcis	"	Jahresbericht für gesam medicin, 1872, 2, 436 N. Y. Med. Rec. June 1, 1872	Gunshot injury.
34	Forster	Scaphoid, internal cuneiform, part of metatarsal	"	Guy's Hosp. Rep. Ser. 3, XVII., 387	
35	Jaesche	All the tarsus except small portions of posterior surface of os calcis, base of 2d metatarsal	Death from pyæmia in 3d week	Langenbeck's Archives, 8 173 Bien, Retr. (Sydenham), 1867–8	

Resections of entire anterior tarsus		15
successful	9	
unsuccessful	3	
fatal	3	
Resections of part of anterior tarsus		6
successful	5	
fatal	1	
Resections of entire posterior and part of anterior tarsus		5
successful	5	
Resections of part of posterior tarsus and anterior tarsus		8
successful	6	
unsuccessful	2	
Resections of entire tarsus		1
fatal	1	
Total		35

Whole number successful	25 (71.4 per ct.)
" " unsuccessful	5 (14.3 per ct.)
" " fatal	5 (14.3 per ct.)

271 RACE STREET, CINCINNATI, April, 1875.

ART. VII.—*Anomalies in Cardiac Pathology.* By EDGAR HOLDEN, M.D., PhD., Newark, N. J., March, 1875. Read before the New Jersey Academy of Medicine.

THE discovery of the inhibitory or reflex function of nervous vitality has probably been the starting-point of more practical knowledge, and more varied research in cardiac pathology, than any since the memorable investigations of Harvey upon the circulation of the blood; and it is interesting to note how the progressive development of knowledge has opened new and more intricate problems, until, to-day, the field of investigation seems just as wide as before.

The common experience that derangements of digestion, emotion, fatigue, and even changes of temperature, could materially affect the heart's rhythm, found ready solution in the distribution and anatomical connection of the pneumogastrics; but physiologists soon brought the functions of these nerves within such narrow limits that it became evident that the mysterious supply of nervous vitality to the heart was not alone from these.

It is necessary to allude with brevity to the present state of our knowledge of this supply in order to render the remarks and cases which follow of practical interest.

A weak current of galvanism through the pneumogastrics will increase the frequency and diminish the force of the heart's pulsation; a stronger current will arrest it; and this, as has been demonstrated by Bernard, is due to direct transmission through the motor filaments.

Division of both pneumogastrics may and does simply diminish the force and increase the frequency of pulsation, and galvanization of each of the cut extremities at once exhibits the character of the usual supply as a direct current—the lower end responding by arrest of the heart's action, the upper giving no evidence of any reflected irritation through the brain or spinal cord.

Finally, the action of woorara upon these nerves in the hands of many physiologists, and the brilliant discoveries of Haller, and Schiff, and Erichsen, and others, regarding the part played by the blood in producing rhythmic contractions, together with the collateral discoveries dating back to Petit, through Dupay, and Reid, and Brachèt, and Brown-Séquard, concerning the true functions of the sympathetic, seem to establish that the whole function of the pneumogastrics, as regards the heart, is to regulate the force and frequency of the pulsations.

The second fact of importance in connection with our subject relates to the now established inherent irritability or contractility of the muscular structure of the heart itself, by which, as may be readily shown, the heart, isolated from all nerve connection, will continue to beat so long as the processes of nutrition maintain the integrity of the muscular tissue. This condition or property has been recently attributed to nervous ganglia discovered by Remak in the structure of the heart itself, but is more frequently believed to be a property common to all unstriped muscular fibre.

It is interesting here to note that, while this irritability is a sufficient cause of contraction, the circulation of blood in its cavities is a stimulating and direct cause of its regular pulsation.

The third fact necessary to our present purpose relates to the functions of the sympathetic.

There have been few of the essential qualities of the heart's rhythmic action, from that of the ascription of its irritability to the cardiac plexus by Brachèt, in 1837, that have not been believed to be connected with this remarkable system of nerves; and it is to this variety of belief that the maze of uncertainty still existing may in some degree be due.

Certainly, so long as the difficulties that surround the isolation of individual plexuses remain, we shall be justified in maintaining our belief that no impairment of function, however erratic, may not be traced to it. The singular cases of intermittent or irregular pulse following a blow on the epigastrium, the vagaries of hysterical disturbance, the violent palpitations of the abdominal aorta without organic change, and even the abnormities arising from constipation or deranged digestion, usually supposed to affect the heart through the vagi, may be cited as familiar.

In this connection I would call attention to the fact that the sphygmograph exhibits in a striking manner the disturbances of minor causes, and the possible derangement of cardiac action through the sympathetic. Thus, anger to such an extent as to flush the face, while not modifying at once the tension of the artery, exhibits in the shock wave of the tracing the increased irritability of the heart's muscular structure; while simple hysteria may vary the tension, the shock wave, and the wave of recoil. The action of the vagi under varying circumstances, upon the heart, is evidenced in the results of a full meal with and without wine, the former varying the tracing both as to amplitude, rhythm, and tension.

Smoking to faintness reduces tbe tension of the arteries to a minimum.

Violent exertion increases the volume of blood discharged at each systole, and the tension of the arterial system is correspondingly increased.

Inordinate dancing produces singular disturbance of *impletive* power and reduced vigour.

Yet it is not the ordinary phenomena of cardiac pathology, however curious, to which I desire to allude. The cases of syncope from tobacco, of palpitation from profound emotion; of pseudo-palpitation, where the diaphragm is alone at fault, and the heart is actually beating regularly; of idiosyncrasies, as in the cases alluded to by Walsh, where green tea invariably produced perversion of rhythm; of traumatic reflex angina pectoris; of local irritants, as in case of Dr. Nooth, occurring in his own person; (Walshe), where "asthmatic seizures and extremely irregular pulse were due to a bullet lodged in the bronchi." These, and a host of others, form a tempting and prolific field; but there are other and more erratic departures from ordinary experience, of equally practical interest.

The cases that form the basis of this paper are culled from notes of private practice; and, while some of them may represent classes, they seem to be unique, and in some sense may be correctly styled anomalies of pathological condition.

There are three classes of cases of this character:—

1. Cardiac disease affecting only the sympathetic system.
2. Cerebro-spinal disorder, with cardiac and pulmonary symptoms only.
3. Cardiac disease with cerebral symptoms only.

In the summer of 1861 there was brought to the Flatbush Hospital on Long Island a young girl, seventeen years of age, who for three weeks had been suffering, apparently, from ordinary intermittent fever of the quotidian type. Up to the week of admission she had not been confined to bed, but the exhausting chills and violent fever had produced an unusual emaciation, and the hacking cough suggested the existence of acute tuberculosis. Ordinary treatment with quinia, arsenic, iron, and salicine, had produced no particle of amelioration. Examination showed no disease of the lungs whatever; the spleen and liver were not constantly or greatly engorged; the functions of the kidneys were normal, and the bowels were by turns constipated and relaxed. No pains other than that in the head, back, and limbs, common alike to the algid state of malarial fever and the irritative chill of phthisis or pyæmia, were complained of, and the intermission was as complete as that of the first named. The heart's action was habitually quick, but not more *rapid* than seemed accountable by the debility and prolonged illness. The thermometer was not then the valuable aid to diagnosis that it now is, and no suspicion had arisen in the mind of any of the medical gentlemen who saw the case of any cardiac disease. The periodical intermission gradually shortened, the fever became more intense, and the sweating more profuse and exhausting; and, without warning, the patient suddenly ceased to breathe one week after admission.

Autopsy revealed no apparent lesion of any organ, the lungs, liver, kidneys, and bowels being singularly sound; but, upon section of the heart, which was slightly larger than usual and of globular shape, the knife exposed an abscess in the walls of the left ventricle at the apex, containing of creamy, laudable pus two and one-half drachms. There was no purulent infiltration of the heart's structure, and no appearance of abscess in other parts of the body; and the pyohæmia, if such was the cause or result of the fatal illness, showed no other lesion. The pericardium was injected only over and opposite the seat of the abscess, and a few bands of lymph were found clinging to a circumscribed spot on the free surface.

Remarks.—Cases of this character are of extreme rarity, and even carditis as a primary affection, and which probably preceded the purulent accumulation in this case, is of very infrequent occurrence.

Nevertheless cases have been recorded upon good authority, and the testimony tends to indicate the almost impossibility of diagnosis before death.

Bouillaud refers to such condition, and even asserts that rupture of such an abscess may be productive of no serious consequence.

Walshe asserts that of such a condition no positive clinical signs are known, and that even general carditis has not fallen within his experience.

The point, however, designed to be obtained in this instance is to call attention to a pathological condition rarely distinguishable during life, even where connected with pyæmia or phlebitis, but here neither accompanied by nor dependent upon either of these affections, a true cardiac disease proving fatal without sign of cardiac injury, through the nervous exhaustion and consequent perversion of nutrition, by which it was accompanied.

We have as the essentials of this case a localized retrograde metamorphosis of tissue and a reflected implication of all vital processes apparently due to a persistent irritation; for, that this was really the condition that produced the chills and the fever and the sweating, seemed evident both from the absence of septic developments in other parts of the body, but chiefly from the fact, not above mentioned, that a true pyogenic membrane seemed to line the walls of the abscess and the actual inflammatory action that may have preceded the development of pus corpuscles had disappeared. If then irritation is the word to express the pathological state that finally exhausted the nervous system, how was this brought about?

If we call to mind the nervous structure and nerve supply of the heart, we shall see how such a termination must be the almost certain result, aside from any mechanical interference with function (a possibility which has not been overlooked) and why it may at the same time be justly termed an anomaly in cardiac pathology. As already stated, the heart possesses an inherent excitability due to the combined influences of its contained ganglia (Remak) and the properties of its unstriped muscular fibres. It is sensitive to its circulating blood and even to water in its cavities; yet it is insensible to outside influences, as it may be cut or handled with apparent impunity.

I have myself the full record of a case in which I passed the three fingers of my right hand into the pericardium, and examined the heart for an expected laceration, in a man now living. Quite recently there appeared, in the *Medical Record* of New York, a case in which a deer was killed which had carried a bullet in its heart for a year. I need not multiply instances to show an apparent immunity of the heart from injuries which we should from *a priori* reasoning consider impossible, and hasten to ask why the circumscribed lesion in the above case should have differed from others of a mechanical nature. Of course, any substance in the heart *may* be an efficient cause for the most severe derangement of the nervous system. Dr. C. H. Jones, in his *Vindematio* appended to his valuable work on nervous disorders, says (p. 578):—

> "We should bear in mind the frequent occurrence of reflex inhibitory action implying the paralysis of cerebro-spinal or sympathetic nerves, as the result of a stimulus morbid in kind or degree, in relation to the centre on which it acts," and further "that vaso-motor paresis seems to constitute an essential part of all febrile movement."

The recurrent chill, the pyrexia, and the sweating, with final exhaustion, here find an explanation; but it seems to me that the probable duration and gradual formation of the abscess might have generated tolerance, as intimated by Bouillaud, but for the fact that the foreign substance in the heart was *pus;* for, call it what we will, whether identical with the white blood corpuscles, the living amœba, the protoplasm of organic life, it is yet *pus*, a most formidable foe to nervous vitality when thus segregated in a living tissue. That the encysted bullet should be innocuous, and the encysted abscess a persistent irritant, seems to warrant the term anomalous.

The *second* class of anomalies, or those of cerebro-spinal disorder with cardiac symptoms, may be illustrated by the following very interesting case, which will be given as briefly as possible.

Dr. ——, a practising physician, age 34, came under observation in September, 1874, suffering from palpitation, cough, irregular pulse, and apparently well-marked hectic. There were thoracic pains confined to the right sub-clavicular and sub-scapular regions, considerable emaciation, great debility, and occasional diarrhœa.

There was no expectoration, and the illness dated back only two weeks. Quite naturally the doctor's prescriptions for himself had been based upon his belief that he was either the victim of phthisis florida or of some cardiac disease.

A careful physical examination revealed no impairment of either heart or lungs excepting only that a low pitched bronchial breathing and complete absence of vesicular murmur on the right side, without dulness or rales, at once called attention to the fact that the right thorax was fixed and immovable. This was moreover at once evident to the eye. The examination was continued, and rigidly, to ascertain the cause of so singular a condition. There was no fluid in the pleuritic cavity, nor evidence of any localized inflammation. The liver was engorged, but not especially tender; there was no evidence of any disease of other organs. The temperature was 100°, pulse irregular in rhythm, and varying from 95 to 120 beats per minute.

Whether the disease from which this patient was suffering was due to a reflected paresis of the long respiratory nerve of Bell (if such a condition is possible without graver complications) or whether primarily an affection of that or the sympathetic, certain it is, that upon the diagnosis of a nervous origin, he took quinia, nitro-muriatic acid, and strychnia, and within one week was able, as he has since assured me, to attend to his patients, and recovered flesh and strength with marvellous rapidity, the cardiac derangement being the first to abate.

The other case under this head was also that of a physician in active practice, and about forty-five years of age. When I was called to see him, he had been confined to house and bed more than a week, with all the usual symptoms of acute pericarditis. By the advice of the physicians who had been with him, and with his own concurrence, antiphlogistic and counter-irritant treatment had been in progress with no particle of amelioration. Debility was progressive. Faintness upon slight movement, coldness of extremities, flashes of heat, rapid and intermittent pulse, intense pain in the præcordia and beneath the left clavicle, were the most marked features.

Upon careful physical examination and measurement I could detect no evidence of effusion or of inflammation, either endocardial or pericardial, and the sphygmograph verified the belief that the disease was not in the heart.

Inquiry developed the fact that for several weeks the doctor had been overworked, and had stimulated his flagging energies by large and repeated doses of quinia averaging twenty grains daily. Alcohol and strychnia produced immediate amelioration of all the distressing symptoms, and a rest of two weeks re-established his health.

Remarks.—Cases of the character of this latter class are not of infrequent occurrence, but it has been rare in my experience to find so positive evidences of organic disease in an organ which was perfectly sound. Of the former case, however, it may be observed that an apparent paralysis of one side of the thorax, without effusion or inflammation discoverable upon careful examination, is of far more infrequent occurrence.

It may be natural to assert that such a condition of effusion or inflammation did exist and was not detected, or at least that the impaired muscular power was simply a reflex phenomenon due to some localized irritant. Certain it is that the engorged liver, which, being without tenderness, was more likely to have been a result than a cause, was the only actually changed organ, and that remedies addressed to the nervous system relieved with marvellous celerity when others given upon other hypotheses had failed.

The *third* and last class of cases, viz., those of cardiac organic disease with only cerebral symptoms, may be illustrated in no more interesting way than by the following case, which was verified by autopsy.

Mrs. B., a widow, aged 38, living in a neighbouring town, had uniformly enjoyed good health and done her own housework, with no warning of cardiac derangement; was suddenly seized with headache, slight giddiness, and nausea, in the act of carrying a scuttle of coals. Without much complaint she lay down upon the bed, and in an hour was apparently as well as before. The next day, however, and daily thereafter at varying intervals, the same symptoms recurred, and gradually a state of semi-unconsciousness was reached which excited the first alarm on the part of her friends. In connection with the two physicians already in attendance I saw her at this stage. The temperature was 99.5°; the pulse small, rapid, and wiry, and 140 per minute. It was impossible to arouse her to consciousness, but there was no coma, and the sleep, if so it may be called, was as natural as in health. The respiration was not hurried, the pupils were sensitive to light, and normal. Sensation and motion were intact, and in brief the condition was, with the single exception of the pulse, that of simple hysterical somnolence.

The character and not the mere rapidity of the pulse, however, excited suspicion; and examination of the heart showed an area of dulness of 7 inches transversely, by 7½ in an oblique direction, the apex displaced to 3 inches outside and above the nipple, and the maximum of systolic impulse transferred to the base. No murmurs existed, but with the symptoms and the horizontal axis of the heart, the diagnosis was clearly hypertrophy with dilatation, and such the subsequent autopsy revealed. The singular somnolence soon became coma, and the patient died in that condition.

There was dilatation of the right, with concentric hypertrophy of the left heart.

Remarks.—One case only under this head need be presented, and I would simply call attention to the fact that the diagnosis was practically accidental; for no symptom referable to the heart had ever, so far as known to the patient's family, been complained of.

The cerebral symptoms are of course easily explained, and the hyperæmia due to the dilated condition of the right auricle is a more or less familiar circumstance, but the total absence of cardiac symptoms even up to the fatal termination, and the final prominence of cerebral symptoms, with so grave an organic lesion as indicated, constitute an anomaly not without practical bearing upon our daily experience.

The autopsy revealed no lesion of the brain, although a general hyperæmia of the tissues was observed.

ART. VIII.—*On the Nature and Duration of Yellow Fever, as shown by Graphic Temperature Charts of Typical Cases; with some remarks on the aid to diagnosis and prognosis, and indications for treatment, furnished by the clinical thermometer.* By GEO. M. STERNBERG, M.D., Brevet Major and Assistant Surgeon U. S. Army. (With four plates of temperature charts.)

THE materials at my command, for such a study as may be expected from the heading of this paper, are by no means so ample as could be desired. But, as I shall shortly point out, they have an especial value of their own which may, to some extent, compensate for a manifest deficiency in number. The generalizations, at which I arrive, may not be sustained when submitted to the test of more extended observations. But the study will, at least, prove profitable by inducing some of the excellent practitioners of medicine in the South, who have not yet adopted the use of the clinical thermometer, to resort to it, not only for their own satisfaction, and in the interests of their patients, but for furnishing additional graphic dilineations of the course of yellow fever. And, also, of the various forms of malarial fevers, which have not yet been sufficiently investigated by this method.

My materials for studying the natural history of yellow fever (so far as the temperature is concerned) are the graphic tracings, given in the accompanying plates, and one hundred and three similar tracings, given in a valuable brochure, recently published in Paris and New Orleans, by Dr. J. C. Faget.[1]

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[1] The Type and Specificity of Yellow Fever. Published by Am. Sutton, 167 Rue Royale, New Orleans.